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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/606,721

06/26/2003

Ian Robinson

NG(ST)-6445

5804

26294

7590

10/26/2007

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EXAMINER

BURD, KEVIN MICHAEL

ART UNIT

PAPER NUMBER

2611

MAIL DATE

DELIVERY MODE

10/26/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/606,721	<b>Applicant(s)</b> ROBINSON ET AL.	
	<b>Examiner</b> Kevin M. Burd	<b>Art Unit</b> 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 14 August 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3-6,9-17 and 19-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-6,9-17,19-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)                        | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

1. This office action, in response to the remarks filed 8/14/2007, is a non-final office action.

### ***Response to Arguments***

2. The previous rejection of the claims under 35 USC 112, first paragraph is withdrawn. A new rejection of claims 14-17 under 35 USC 112, second paragraph is stated below.
3. The previous rejections of claims 1, 3-6, 9-11 and 22-25 are withdrawn. New rejections of these claims are stated below.
4. Applicant's arguments filed 8/14/2007 have been fully considered but they are not persuasive. Figure 5 of Muller discloses the input signal is input to a serial to parallel converter creating a plurality of copies of the input signal. These are the replicas of the input signal. The signals are then processed and combined as stated in the office action. For this reason and the reasons stated in the previous office action, the rejection of the claims is maintained and stated below.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 14-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 14-17, the phrase "such as" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 9-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Kupferschmidt et al (WO 01/43320 A2). Kupferschmidt et al (US 7,080,006) is a translation of WO 01/43320 A2.

Regarding claims 9-11, Kupferschmidt discloses a communication system comprising communication devices. A transmitter transmits digital data. The transmitter also transmits an instruction signal comprising a scale factor that corresponds to the data. Column 1, lines 11-31 disclose the transmission of the data and scale factor. Figure 1 shows the reference value selection 4 and reference value 5 of the data frame includes the scale factor (column 5, lines 47-53). Figure 1 shows audio data 6 and additional data 7 is transmitted after the scale factors (column 4, lines 48-53). The scale

factors are used for the decoding of digital audio data which is used to perform an error recognition dependent on transmitted reference values e.g., scale factors (abstract).

7. Claims 12, 13, 20 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Muller et al "OFDM with Reduced Peak-to-Average Power Ratio by Multiple Signal Representation", vol. 52, no. 1/2, 2/1997, XP 000991143. Ghanadan et al (US 6,294,956) provides information regarding the term replica.

Regarding claims 12, 13, 20 and 21, Muller discloses a method and apparatus for splitting an input signal into a plurality of replica signals (figure 5). The replica signals are scaled to reduce the peak values (figure 5 and page 63). The signals are combined in the adder of figure 5. The combined signal is amplified by a power amplifier (page 59). Muller does not disclose what constitutes a replica signal. Muller discloses the carriers are divided into subcarriers. Ghanadan discloses an amplification system shown in figure 17. Ghanadan discloses the original signal S is transformed into signals that are more power efficient by selectively shaping different portions of the signal S (column 14, lines 26-32). This will produce signals with reduced PAR. As such, a signal with different carriers or tones can be selectively separated (column 14, lines 32-36). Figure 17 shows a splitter 138 that provides replicas of the signal to two orthogonal filters 134 and 136. The filters 134 and 136 shape the frequency content of the different versions of the signal to improve power efficiency of the transformed signals X1 and X2 compared to the power efficiency of the original signal (column 14, lines 39-45). The context of Ghanadan's "replica" term is consistent with Muller's signal shown in figure 5.

8. Claims 14, 15, 17, 19 and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Corral (US 2004/0086054).

Regarding claims 14 and 15, Corral discloses a communication system comprising communication devices. The communication device includes a signal modifier that modifies an input signal to reduce peak values associated with the input signal and provides a peak reduced input signal. Figure 8 discloses the transmitter. A large peak is cancelled through the subtraction of a reference function of the transmitted signal. An "anti-peak" signal is generated and summed to the original signal (paragraph 0027). The transmitter inserts side information prior to the transmission of the signal (figure 8, block 106). To enable the receiver to recover the data, a pointer to the multiplying sequence can be transmitted as side information (paragraph 0031). The signal will be amplified prior to transmission (paragraph 0020). The side information and data are combined to be "transmitted in a parallel relationship".

Regarding claims 17 and 19, Corral discloses a communication system comprising communication devices. The communication device includes a signal modifier that modifies an input signal to reduce peak values associated with the input signal and provides a peak reduced input signal. Figure 8 discloses the transmitter. A large peak is cancelled through the subtraction of a reference function of the transmitted signal. An "anti-peak" signal is generated and summed to the original signal (paragraph 0027). The transmitter inserts side information prior to the transmission of the signal (figure 8, block 106). To enable the receiver to recover the data, a pointer to the multiplying sequence can be transmitted as side information (paragraph 0031). The

signal will be amplified prior to transmission (paragraph 0020). The side information and data are combined to be "transmitted in a sequential relationship". The side information is inserted into the data but can be inserted into the beginning, middle or end of the data packet.

Regarding claim 22, Corral discloses a communication system comprising communication devices. The communication device includes a signal modifier that modifies an input signal to reduce peak values associated with the input signal and provides a peak reduced input signal. Figure 8 discloses the transmitter. A large peak is cancelled through the subtraction of a reference function of the transmitted signal. An "anti-peak" signal is generated and summed to the original signal (paragraph 0027). The transmitter inserts side information prior to the transmission of the signal (figure 8, block 106). To enable the receiver to recover the data, a pointer to the multiplying sequence can be transmitted as side information (paragraph 0031). The signal will be amplified prior to transmission (paragraph 0020).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1 and 3-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Corral (US 2004/0086054) in view of Tong et al (US 2003/0099302).

Regarding claim 1, Corral discloses a communication device. The communication device includes a signal modifier that modifies an input signal to reduce peak values associated with the input signal and provides a peak reduced input signal. Figure 8 discloses the transmitter. A large peak is cancelled through the subtraction of a reference function of the transmitted signal. An "anti-peak" signal is generated and summed to the original signal (paragraph 0027). The transmitter inserts side information prior to the transmission of the signal (figure 8, block 106). The signal will be amplified prior to transmission (paragraph 0020). Corral does not disclose shaping a modulation constellation of the input signal to reduce the peak values associated with the input signal. Tong discloses constellation shaping as shown in figure 5. Constellation shaping is a method of reducing the power required to transmit data relative to the power required for an unshaped constellation while keeping the minimum distance between constellation points the same (paragraphs 0054-0057). Therefore, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the shaping components of Tong into the device of Corral to further reduce the power of the system.

Regarding claims 3, 4 and 25, paragraph 0027 of Corral discloses the combining of an instruction signal with the input signal to generate a peak reduced signal.

Regarding claim 5, Corral discloses the PAR reduction is used in an OFDM system (abstract).

Regarding claim 6, Corral discloses the DAC that converts the peak reduced signal to an analog signal prior to transmission (paragraph 0024).



10. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Corral (US 2004/0086054) in view of Muller et al "OFDM with Reduced Peak-to-Average Power Ratio by Multiple Signal Representation", vol. 52, no. 1/2, 2/1997, XP 000991143. Ghanadan et al (US 6,294,956) provides information regarding the term replica.

Regarding claim 16, Corral discloses the communication system disclosed above in paragraph 8. Corral does not disclose decomposing the input signal into a plurality of replicas. Muller discloses a method and apparatus for splitting an input signal into a plurality of replica signals (figure 5). The replica signals are scaled to reduce the peak values (figure 5 and page 63). The signals are combined in the adder of figure 5. The combined signal is amplified by a power amplifier (page 59). Muller does not disclose what constitutes a replica signal. Muller discloses the carriers are divided into subcarriers. Ghanadan discloses an amplification system shown in figure 17. Ghanadan discloses the original signal S is transformed into signals that are more power efficient by selectively shaping different portions of the signal S (column 14, lines 26-32). This will produce signals with reduced PAR. As such, a signal with different carriers or tones can be selectively separated (column 14, lines 32-36). Figure 17 shows a splitter 138 that provides replicas of the signal to two orthogonal filters 134 and 136. The filters 134 and 136 shape the frequency content of the different versions of the signal to improve power efficiency of the transformed signals X1 and X2 compared to the power efficiency of the original signal (column 14, lines 39-45). The context of Ghanadan's "replica" term is consistent with Muller's signal shown in figure 5. It would have been obvious to

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combine the teaching of Muller into the communication system of Corral to allow for the very flexible and distortionless methods for the reduction of the peak to average ratio to be realized (Muller page 59, left column).

11. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Corral (US 2004/0086054) in view of Kupferschmidt et al (WO 01/43320 A2). Kupferschmidt et al (US 7,080,006) is a translation of WO 01/43320 A2.

Regarding claim 23, Corral discloses the communication system stated above in paragraph 8. Corral does not disclose transmitting a scale factor with the data associated with reducing peak values. Kupferschmidt discloses a communication system comprising communication devices. A transmitter transmits digital data. The transmitter also transmits an instruction signal comprising a scale factor that corresponds to the data. Column 1, lines 11-31 disclose the transmission of the data and scale factor. Figure 1 shows the reference value selection 4 and reference value 5 of the data frame includes the scale factor (column 5, lines 47-53). Figure 1 shows audio data 6 and additional data 7 is transmitted after the scale factors (column 4, lines 48-53). The scale factors are used for the decoding of digital audio data which is used to perform an error recognition dependent on transmitted reference values e.g., scale factors (abstract). The scale factor is associated with reducing the peak value since an error is detected when the signal is above a predetermined threshold (column 6, lines 11-18). It would have been obvious for one of ordinary skill in the art at the time of the

invention to combine the system of Kupferschmidt into the system of Corral to provide a plausible test for error and to correct the errors (Kupferschmidt, column 1, lines 53-61).

12. Claims 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Corral (US 2004/0086054) in view of Tong et al (US 2003/0099302) further in view of Kupferschmidt et al (WO 01/43320 A2). Kupferschmidt et al (US 7,080,006) is a translation of WO 01/43320 A2.

Regarding claim 24, the combination of Corral and Tong disclose the communication system stated above in paragraph 9. The combination does not disclose transmitting a scale factor with the data associated with reducing peak values. Kupferschmidt discloses a communication system comprising communication devices. A transmitter transmits digital data. The transmitter also transmits an instruction signal comprising a scale factor that corresponds to the data. Column 1, lines 11-31 disclose the transmission of the data and scale factor. Figure 1 shows the reference value selection 4 and reference value 5 of the data frame includes the scale factor (column 5, lines 47-53). Figure 1 shows audio data 6 and additional data 7 is transmitted after the scale factors (column 4, lines 48-53). The scale factors are used for the decoding of digital audio data which is used to perform an error recognition dependent on transmitted reference values e.g., scale factors (abstract). The scale factor is associated with reducing the peak value since an error is detected when the signal is above a predetermined threshold (column 6, lines 11-18). It would have been obvious for one of ordinary skill in the art at the time of the invention to combine the system of

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Kupferschmidt into the system of the combination of Corral and Tong to provide a plausible test for error and to correct the errors (Kupferschmidt, column 1, lines 53-61).

Regarding claim 25, Kupferschmidt discloses the data and scaling factors are transmitted concurrently in that the data is translated in the same data frame as shown in figure 1.

Regarding claim 26, Kupferschmidt discloses scaling factors are placed prior to the data in the frame in claim 1.

### ***Conclusion***

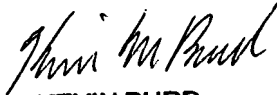
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M. Burd whose telephone number is (571) 272-3008. The examiner can normally be reached on Monday - Friday 9 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David C. Payne can be reached on (571) 272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Kevin M. Burd  
10/24/2007

  
**KEVIN BURD**  
**PRIMARY EXAMINER**